



Tina  
Lowery/ARTD/R7/USEPA/US  
08/02/04 12:53 PM

To Patricia Murrow/ARTD/R7/USEPA/US@EPA  
cc  
bcc  
Subject Lockwood Final Report



Pat,

Attached is the final report regarding the Lockwood Facility in Gering, Nebraska. Please and tell me if this is enough information for us to obtain the 750. Kevin states that they have determined that the arsenic is not coming from the property and that is his final report. I have also not heard from the contractor whom you assigned to review the files and complete the paperwork. If this report is fine, please forward to the contractor so that we can get the EI.

Let me know, thanks!



Agromac Final Report Addendum.wpd

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459622



RCRA RECORDS

June 4, 2004

Mr. Roy Crossland  
START Project Officer  
U.S. Environmental Protection Agency, Region 7  
901 North 5<sup>th</sup> Street  
Kansas City, Kansas 66101

**Subject: Addendum to Removal Assessment Report  
Agromac-Lockwood Site, Gering, Nebraska  
U.S. EPA Region 7 START 2, Contract No. 68-S7-01-41, Task Order No. 0187  
Task Monitor: Kevin Larson, On-Scene Coordinator**

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached addendum to the Removal Assessment Report (dated March 22, 2002) for the Agromac-Lockwood site in Gering, Nebraska, summarizing activities conducted in late April 2004. If you have any questions or comments, please contact the Tetra Tech START Project Manager, Jeff Hodge, at (913) 495-3945.

Sincerely,

Jeff Hodge  
START Project Manager

Hieu Q. Vu, PE, CHMM  
START Program Manager

Enclosure

## 1.0 INTRODUCTION

This document will serve as an addendum to the Removal Assessment (RA) report for the Agromac-Lockwood site, located in Gering, Nebraska (see Appendix A, Figure 1), submitted to the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division on March 22, 2002. Additional sampling was required to delineate arsenic contamination in groundwater, and lead and zinc contamination in soils, detected in January 2002. The sampling activities were performed by the Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START). The followup field work was conducted April 25-29, 2004. Tetra Tech START team members included Jeff Hodge, project manager; Roger Stull, health and safety officer; and a field team comprised of Courtney Nichols and Daniel Strong. All sampling-related activities were recorded in a logbook (see Appendix B). Photographs were also taken to document site activities (see Appendix C). The EPA On-Scene Coordinator for the project was Kevin Larson.

## 2.0 SAMPLING ACTIVITIES

During this sampling event, Tetra Tech START collected groundwater and soil samples. The following text summarizes the samples by matrix type.

### 2.1 Groundwater Samples

A total of 42 groundwater samples, including 6 field duplicates, 1 field blank, and 1 rinsate, were collected during the April 2004 RA.

#### Municipal and Private Wells

Thirteen of the 42 samples were collected from 1 municipal well and 11 private wells (including 1 duplicate). One sample was collected from the only municipal well (sample ID: 116) within 1 mile of the site. This well was located approximately 200 feet west of the site, on the south side of an alley immediately south of K street. The municipal well is not used by the city; it is maintained for emergency purposes only. The private wells were also located within 1 mile of the site. Groundwater flow at the site was documented during this and previous sampling events to be to the northeast, toward the North Platte River (see Appendix A, Figure 2). Nine of the private wells were located north and east of the site (hydrologically downgradient of the site). The other two private wells were hydrologically upgradient of the site. Figure 3 in Appendix A illustrates the municipal and private well sample locations. Table 1

summarizes well owners, locations, dates and times of sampling, and purge volumes for the samples collected from the municipal and private wells.

The municipal and private well samples were collected from taps or spigots near the well heads, prior to any treatment systems. The supply lines and systems were purged for at least 5 minutes before the samples were collected. Water quality parameters (pH, turbidity, conductivity, and temperature) were recorded during the purging process to ensure the well had stabilized prior to sampling. Stabilization was considered to be complete when three consecutive readings for each parameter varied less than 10 percent. The water quality parameters were recorded on field sheets, which are included in Appendix D.

#### Monitoring Wells

Twenty-seven of the 42 groundwater samples were collected from 22 monitoring wells (with 5 duplicates; see Appendix A, Figure 4). Twenty-one of the 22 monitoring wells were located on site, with the remaining monitoring well located approximately 100 feet west of the southwest corner of the site. Monitoring well LW 6 was not sampled during this activity, because electrical service had been disconnected to a pump installed in the well. Table 2 summarizes well owners, locations, purge volumes, etc., for the samples collected from the monitoring wells. An Envirotech® pump with disposable polyethylene tubing was used to purge the wells and collect the samples. Prior to collecting each sample, a minimum of three casing volumes of water was purged from the well. The temperature, pH, turbidity, and conductivity of the purge water was measured after each well volume to ensure that the stagnant water in the well had been removed and stabilization had occurred prior to sample collection. The well was considered to be stabilized when the variation between three consecutive readings was no greater than 10 percent for any given parameter.

A field sheet was completed for each monitoring well sample. The field sheets included the following information: water quality parameters, purge times, estimated purge volumes, exact sample locations, and analyses to be performed. A copy of the field sheets completed for the monitoring wells is included in Appendix D.

All water samples collected during this activity (i.e., from municipal, private, and monitoring wells) were analyzed for total and dissolved metals. The groundwater samples to be analyzed for total metals were poured directly into 1-liter polyethylene containers pre-preserved with nitric acid. The groundwater

samples to be analyzed for dissolved metals were filtered, using disposable 0.45 micron Nalgene® filters, before they were transferred to 1-liter cubitainers. After the samples were collected in the 1-liter polyethylene containers, they were immediately placed in a cooler containing ice. The samples were maintained at or below 4 degrees Celsius (° C) pending submittal to Keystone Laboratories, Inc. in Newton, Iowa. The laboratory analyzed the samples for total metals and dissolved metals by EPA SW-846 methods 6010B and 6020, respectively.

TABLE 1

**PRIVATE AND MUNICIPAL WELL SAMPLE SUMMARY  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

Sample ID	Owner	Location	Date	Time	Purge Volume (gal)
102	Henry & Wanda Henkel	600 feet north of Lockwood/Railroad intersection, 1,000 feet west of Lockwood on long driveway	4/27/04	18:31	10
103	Murphy Tractor & Equipment Co.	220810 Highway 92	4/27/04	17:00	NA
106	Tax Express	600 feet east of Highway 92/Lockwood intersection, south side of Highway 92	4/27/04	19:50	52
108	Ronald & Rosaline Greckel	130853 Lockwood Road	4/28/04	08:17	85
109	Steven & Nelda Robison	130897 Lockwood Road	4/27/04	17:36	37.5
110	Jerold & Rosalie Higel	131015 Lockwood Road	4/27/04	17:51	25
111	Jerold & Rosalie Higel	131015 Lockwood Road	4/27/04	18:04	NA
112	Tom & Lois Anderson	230246 County Road P	4/28/04	08:50	25
113	Wolfe & Diann Gitschel	230274 County Road P	4/27/04	17:43	20
113-Dup	Wolfe & Diann Gitschel	230274 County Road P	4/27/04	17:43	20
114	Frank Strong	1,200 feet south of County Road P/Lockwood intersection, west side of Lockwood. Before creek	4/27/04	18:20	50
115	Mark Chrisman	140142 Sunset Drive	4/28/04	10:25	NA
116	City of Gering	200 feet west of Agromac site	4/28/04	09:19	approx. 8,000

Notes:

gal -Gallons  
ID -Identification  
NA -Not applicable

TABLE 2

**MONITORING WELL SAMPLE SUMMARY  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

Sample ID	Owner	Location	Date	Time	Purge Volume (gal)	Depth of Well (ft)	Depth to Water (ft)
117	Agromac International, Inc	Monitoring Well LW 1	4/26/04	14:50	15	43.32	20.73
118	Agromac International, Inc	Monitoring Well LW 2	4/27/04	09:33	9.1	37.8	19.5
119	Agromac International, Inc	Monitoring Well LW 3	4/27/04	08:52	5	27.5	20.5
120	Agromac International, Inc	Monitoring Well LW 4	4/27/04	07:32	10	27.92	14.29
121	Agromac International, Inc	Monitoring Well LW 5	4/27/04	10:20	4.4	27.4	18.5
123	Agromac International, Inc	Monitoring Well LW 7	4/27/04	07:30	2	29.9	19.3
124	Agromac International, Inc	Monitoring Well LW 8	4/27/04	08:17	5.9	33.8	21.9
125	Agromac International, Inc	Monitoring Well RF 1	4/26/04	17:13	8	27.63	12.44
126	Agromac International, Inc	Monitoring Well RF 2	4/26/04	17:27	5	18.16	12.21
127	Agromac International, Inc	Monitoring Well RF 3	4/27/04	08:20	10	27.52	12.95
128	Agromac International, Inc	Monitoring Well RF 4	4/27/04	10:03	8.6	38	20.9
129	Agromac International, Inc	Monitoring Well RF 5	4/26/04	16:25	9	38.47	20.83
130	Agromac International, Inc	Monitoring Well MI 1	4/27/04	13:10	75	23.89	9.38
130-Dup	Agromac International, Inc	130-Dup	4/27/04	13:10	75	23.89	9.38
131	Agromac International, Inc	Monitoring Well MI 2	4/27/04	12:35	77.1	27.4	10.2

TABLE 2

**MONITORING WELL SAMPLE SUMMARY  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

Sample ID	Owner	Location	Date	Time	Purge Volume (gal)	Depth of Well (ft)	Depth to Water (ft)
132	Agromac International, Inc	Monitoring Well M 1	4/27/04	12:50	45	25.49	10.22
132-Dup	Agromac International, Inc	132-Dup	4/27/04	12:50	45	25.49	10.22
133	Agromac International, Inc	Monitoring Well	4/27/04	14:45	41	29.86	10.2
133-Dup	Agromac International, Inc	133-Dup	4/27/04	14:45	41	29.86	10.21
134	Agromac International, Inc	Monitoring Well M 3	4/27/04	15:07	35	28.7	11.10
135	Agromac International, Inc	Monitoring Well M 4	4/27/04	11:15	35	27.42	11.13
135-Dup	Agromac International, Inc	135-Dup	4/27/04	11:15	35	27.42	11.13
136	Agromac International, Inc	Monitoring Well M 5	4/27/04	09:15	31	26.8	11.43
137	Agromac International, Inc	Monitoring Well M 6	4/27/04	12:03	37.2	29.6	10.8
138	Agromac International, Inc	Monitoring Well M 7	4/27/04	10:15	45	28.72	10.97
138-Dup	Agromac International, Inc	138-Dup	4/27/04	10:18	45	28.72	10.97
139	Furst McNess Co	Monitoring Well M 8	4/27/04	15:47	36.2	29.6	11.3

Notes:

ft        -Feet  
gal       -Gallons  
ID        -Identification



## 2.2 Soil Samples

A total of 36 soil samples, including 4 field duplicates, were collected from 16 boreholes south of the on-site galvanizing building (see Appendix A, Figure 5). These samples were collected from 0 to 2 feet below ground surface (bgs) and 2 to 4 feet bgs at each location using a Geoprobe™ hydraulic direct push apparatus. Each of the samples was placed in a disposable aluminum pie pan, homogenized, transferred to an 8-ounce glass container, and immediately placed in a cooler containing ice. The samples were maintained at or below 4 ° C pending submittal to Keystone Laboratories, Inc. in Newton, Iowa. The laboratory analyzed the samples for lead and zinc by EPA SW-846 method 6010B. A field sheet, which included the exact sample location and analyses to be performed, was completed for each soil sample. A copy of the field sheets is included in Appendix D.

## 3.0 ANALYTICAL DATA SUMMARY

Metals were detected in 41 of the 42 groundwater samples and all soil samples collected during this RA. Laboratory results for total and dissolved metals in the groundwater samples are shown in Appendix A, on Figures 6 through 9. The following text discusses the metals data by sample matrix type.

### 3.1 Groundwater Samples

#### Municipal and Private Wells

Sixteen different metal analytes were detected in the municipal well and 12 private well samples at concentrations that ranged from 0.05 to 30,700 micrograms per liter (µg/L). All sixteen metals were detected in the sample collected from the municipal well. The reported concentrations in this sample ranged from 0.06 to 10,500 µg/L. Of the sixteen reported total metals, arsenic was the only one that was reported at a level that exceeded a health-based benchmark. It was reported at 6.00 µg/L, which exceeds the EPA Region 9 tap water Preliminary Remediation Goal (PRG) of 0.45 µg/L. In the private wells, arsenic was also the only total metal that was reported at a concentration greater than a health-based benchmark. It was detected in every sample, at concentrations that ranged from 13.0 to 28.0 µg/L, all of which exceed the Maximum Contaminant Level (MCL) and EPA Region 9 tap water PRG of 10.0 and 0.45 µg/L, respectively. Table 3 summarizes the sample identification numbers, total metals analytical data, and health-based benchmarks for the samples collected from the municipal well and private wells.

Dissolved metals were detected in the municipal well sample and in all 12 of the private well samples. Twelve dissolved metals were detected in these samples at concentrations that ranged from 0.056 to 29,900 µg/L. Ten of the 12 metals were detected in the sample collected from the municipal well. The reported concentrations in this sample ranged from 0.056 to 9,340 µg/L. Of the 10 reported dissolved metals, arsenic was the only one that was reported at a level that exceeded a health-based benchmark. It was reported at 7.00 µg/L, which exceeds its EPA Region 9 tap water Preliminary Remediation Goal (PRG) of 0.45 µg/L. In the private wells, arsenic was also the only total metal that was reported at a concentration greater than a health-based benchmark. It was detected in every sample, at concentrations that ranged from 16.0 to 32.0 µg/L, all of which exceed its MCL and EPA Region 9 tap water PRG of 10.0 and 0.45 µg/L, respectively. Table 4 summarizes the sample identification numbers, dissolved metals analytical data, and health-based benchmarks for the samples collected from the municipal well and private wells.

#### Monitoring Wells

At least eight total metals were detected in each monitoring well sample. Twenty different total metals were detected in the 27 monitoring well samples. The concentrations in the samples ranged from 5.00 to 350,000 µg/L. Arsenic, iron, manganese, and strontium were reported at concentrations that exceeded a health-based benchmark. Arsenic was detected in 22 of the 27 samples, at concentrations that ranged from 5.00 to 113 µg/L. Twenty-one of the 22 samples exceeded the MCL for arsenic of 10.0 µg/L, and all of the samples that reported a detection of arsenic exceeded the EPA Region 9 tap water PRG of 0.45 µg/L. Eleven of the 27 samples contained iron at concentrations that ranged from 695 to 28,400 µg/L. Only 1 of the 11 reported iron concentrations exceeded a health-based benchmark (EPA Region 9 tap water PRG of 11,000 µg/L). Manganese was detected in 20 of the 27 samples, at concentrations that ranged from 7.00 to 2,780 µg/L. Four of the 20 reported concentrations exceeded the EPA Region 9 tap water PRG of 880 µg/L. Strontium was detected in all of the samples, at concentration that ranged from 350 to 590,000 µg/L. Four of the reported concentrations for strontium exceeded its EPA Region 9 tap water PRG of 2,200 µg/L. Table 5 summarizes the sample identification numbers, total metals analytical data, and health-based benchmarks for the samples collected from the monitoring wells.

At least eight dissolved metals were detected in each monitoring well sample. Sixteen different dissolved metals were detected in the 27 monitoring well samples. The concentrations in the samples ranged from 5.00 to 340,000 µg/L. Arsenic, manganese, and strontium were reported at concentrations

that exceeded a health-based benchmark. Arsenic was reported for 21 of the 27 samples, at concentrations that ranged from 5.00 to 112 µg/L. Twenty of the 27 samples exceeded the MCL for arsenic of 10.0 µg/L, and all of the samples that reported a detection of arsenic exceeded the EPA Region 9 tap water PRG of 0.45 µg/L. Manganese was detected in 13 of the 27 samples, at concentrations that ranged from 5.00 to 2,560 µg/L. Four of the 13 reported concentrations exceeded the EPA Region 9 tap water PRG of 880 µg/L. Strontium was detected in all 27 samples, at concentrations ranging from 400 to 2,900 µg/L. One of those concentrations exceeded the EPA Region 9 tap water PRG of 2,200 µg/L. Table 6 summarizes the sample identification numbers, dissolved metals analytical data, and health-based benchmarks for the samples collected from the monitoring wells.

TABLE 3

**ANALYTICAL DATA SUMMARY  
FOR TOTAL METALS IN MUNICIPAL AND PRIVATE WELL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

	Aluminum	Arsenic	Barium	Boron	Copper	Iron	Lead	Lithium	Magnesium	Manganese	Potassium	Silica	Sodium	Strontium	Titanium	Zinc
Sample ID	Sample results and Health-Based Benchmarks are listed in micrograms per liter															
102	ND	14.0	47.0	266	ND	ND	ND	ND	25,800	42.0	13.0	57.8	130	1.70	ND	10.0
103	ND	13.0	61.0	300	8.00	182	ND	0.05	24,400	ND	17.0	59.9	230	1.50	ND	31.0
106	3,870	15.0	108	315	10.0	3,200	5.00	0.05	23,600	187	18.0	96.3	230	1.30	140	46.0
108	ND	19.0	40.0	254	8.00	ND	ND	0.06	27,200	ND	20.0	64.2	210	1.80	ND	ND
109	ND	16.0	61.0	261	12.0	ND	ND	0.06	30,700	ND	32.0	62.1	210	2.10	ND	ND
110	ND	20.0	51.0	316	ND	ND	ND	ND	20,100	ND	18.0	62.1	240	1.30	ND	ND
111	ND	20.0	48.0	312	7.00	ND	ND	ND	22,200	ND	19.0	64.2	250	1.50	ND	ND
112	ND	20.0	44.0	302	12.0	ND	ND	0.06	21,500	ND	19.0	62.1	240	1.60	ND	ND
113	ND	20.0	75.0	311	21.0	ND	ND	0.06	21,200	ND	18.0	62.1	240	1.50	ND	ND
113-DUP	ND	20.0	40.0	310	5.00	ND	ND	0.05	21,100	ND	18.0	62.1	230	1.50	ND	ND
114	ND	22.0	37.0	303	ND	ND	ND	0.06	19,200	ND	17.0	59.9	220	1.30	ND	ND
115	ND	28.0	44.0	303	ND	ND	ND	0.05	17,000	ND	15.0	62.1	230	1.20	ND	ND
116	5,000	6.00	304	500	21.0	3,860	9.00	0.06	10,500	481	14.0	74.9	360	0.78	150	27.0
MCL	NE	10.0	2,000	NE	1,300*	NE	15.0*	NE	NE	NE	NE	NE	NE	NE	NE	NE
PRG	36,000	0.45	2,600	7,300	1,500	11,000	NE	730	NE	880	NE	NE	NE	2,200	NE	11,000

## Notes:

Shaded results exceed a health-based benchmark.

The preliminary remediation goal for arsenic assumes a cancer endpoint.

\* - Value indicates Environmental Protection Agency action level

ID - Identification

MCL - Maximum contaminant level

ND - Not detected

NE - Not established

PRG - Preliminary remediation goal

**TABLE 4**

**ANALYTICAL DATA SUMMARY**  
**FOR DISSOLVED METALS IN MUNICIPAL AND PRIVATE WELL SAMPLES**  
**AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

	Arsenic	Barium	Boron	Copper	Lithium	Magnesium	Manganese	Potassium	Silica	Sodium	Strontium	Zinc
Sample ID	<i>Sample results and Health-Based Benchmarks are listed in micrograms per liter</i>											
102	17.0	44.0	262	ND	ND	25,200	33.0	8.70	51.4	140	1.90	10.0
103	17.0	57.0	298	ND	0.064	24,000	ND	12.0	51.4	230	1.70	24.0
106	16.0	52.0	307	ND	0.068	21,700	112	13.0	62.1	240	1.40	13.0
108	22.0	34.0	246	6.00	0.062	26,500	ND	16.0	62.1	210	1.90	ND
109	19.0	42.0	258	12.0	0.077	29,900	ND	26.0	62.1	210	2.40	ND
110	24.0	45.0	299	ND	0.062	18,800	ND	14.0	59.9	250	1.30	ND
111	23.0	38.0	301	ND	0.072	21,500	ND	14.0	62.1	240	1.60	ND
112	25.0	38.0	312	12.0	0.072	21,900	ND	16.0	59.9	230	1.60	ND
113	24.0	34.0	302	ND	0.056	20,400	ND	16.0	57.8	230	1.50	ND
113-DUP	24.0	35.0	311	ND	0.066	21,000	ND	16.0	59.9	230	1.50	ND
114	27.0	35.0	305	ND	0.061	18,600	ND	14.0	68.5	230	1.40	ND
115	32.0	42.0	315	ND	0.062	17,600	ND	13.0	66.3	210	1.20	ND
116	7.00	190	483	ND	0.056	9,340	12.0	13.0	44.9	330	0.84	ND
MCL	10.0	2,000	NE	1,300*	NE	NE	NE	NE	NE	NE	NE	NE
PRG	0.45	2,600	7,300	1,500	730	NE	880	NE	NE	NE	2,200	11,000

Notes:

Shaded results exceed a health-based benchmark.

The preliminary remediation goal for arsenic assumes a cancer endpoint.

- \* - Value indicates Environmental Protection Agency action level
- ID - Identification
- MCL - Maximum contaminant level
- ND - Not detected
- NE - Not established
- PRG - Preliminary remediation goal



**ANALYTICAL DATA SUMMARY  
FOR TOTAL METALS IN MONITORING WELL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

[illegible]

**TABLE 5**

**ANALYTICAL DATA SUMMARY  
FOR TOTAL METALS IN MONITORING WELL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

TABLE 6

**ANALYTICAL DATA SUMMARY  
FOR DISSOLVED METALS IN MONITORING WELL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

	Arsenic	Barium	Boron	Chromium	Iron	Lithium	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silica	Sodium	Strontium	Vanadium	Zinc
Sample ID	Sample results and Health-Based Benchmarks are listed in micrograms per liter															
117	16.0	55.0	274	ND	ND	70.0	24,900	ND	ND	ND	9,400	59,900	230,000	1,700	ND	ND
118	20.0	55.0	288	ND	ND	59.0	20,400	ND	ND	ND	12,000	62,100	230,000	1,700	ND	ND
119	18.0	30.0	450	ND	ND	86.0	16,700	ND	ND	ND	12,000	59,900	290,000	1,400	ND	ND
120	12.0	34.0	295	ND	ND	74.0	37,400	168	ND	ND	52,000	51,400	210,000	2,900	ND	ND
121	112	24.0	449	ND	ND	ND	6,460	ND	28.0	ND	9,300	49,200	340,000	400	60.0	ND
123	20.0	30.0	350	6.00	ND	73.0	14,500	ND	ND	ND	10,000	57,800	230,000	980	ND	ND
124	52.0	26.0	422	ND	ND	57.0	11,900	ND	25.0	ND	9,500	57,800	290,000	760	ND	ND
125	20.0	28.0	263	ND	ND	69.0	20,200	ND	ND	ND	11,000	64,200	210,000	1,400	ND	ND
126	14.0	32.0	255	ND	ND	74.0	20,000	ND	ND	ND	11,000	53,500	200,000	1,300	ND	ND
127	16.0	28.0	266	ND	ND	68.0	28,500	ND	ND	ND	12,000	55,600	210,000	2,100	ND	ND
128	20.0	50.0	297	ND	ND	63.0	20,400	ND	ND	ND	11,000	62,100	240,000	1,700	ND	ND
129	23.0	31.0	424	ND	ND	ND	14,200	ND	10.0	ND	7,100	53,500	270,000	930	ND	ND
130	ND	ND	235	ND	586	54.0	13,500	520	ND	8.00	7,800	51,400	190,000	500	ND	201
130-DUP	ND	ND	233	ND	638	63.0	13,600	518	ND	8.00	7,800	49,200	190,000	560	ND	204
131	14.0	70.0	207	ND	ND	59.0	22,100	90.0	ND	ND	19,000	51,400	170,000	1,400	ND	97.0
132	ND	ND	153	ND	4,860	ND	16,100	2,560	ND	24.0	7,200	34,200	120,000	1,900	ND	190
132-DUP	ND	ND	150	ND	4,600	ND	15,400	2,490	ND	21.0	8,600	34,200	120,000	1,800	ND	179
133	19.0	39.0	216	ND	ND	51.0	28,800	5.00	ND	ND	16,000	55,600	180,000	1,600	ND	ND
133-DUP	20.0	40.0	217	ND	ND	52.0	28,700	ND	ND	ND	17,000	55,600	180,000	1,800	ND	ND
134	5.00	46.0	206	ND	128	51.0	13,900	572	ND	ND	9,000	42,800	170,000	950	ND	131
135	ND	ND	189	ND	ND	70.0	26,100	2,030	ND	97.0	22,000	36,400	150,000	1,400	ND	111
MCL	10.0	2,000	NE	100	NE	NE	NE	NE	NE	100	NE	NE	NE	NE	NE	NE
PRG	0.45	2,600	7,300	NE	11,000	730	NE	880	180	NE	NE	NE	NE	2,200	260	11,000
135-DUP	ND	ND	194	ND	139	62.0	26,300	2,050	ND	102	22,000	34,200	150,000	1,200	ND	114



TABLE 6

**ANALYTICAL DATA SUMMARY  
FOR DISSOLVED METALS IN MONITORING WELL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

	Arsenic	Barium	Boron	Chromium	Iron	Lithium	Magnesium	Manganese	Molybdenum	Nickel	Potassium	Silica	Sodium	Strontium	Vanadium	Zinc
Sample ID	<i>Sample results and Health-Based Benchmarks are listed in micrograms per liter</i>															
136	12.0	59.0	124	ND	ND	ND	26,600	ND	ND	ND	21,000	26,100	120,000	1,700	ND	ND
137	14.0	45.0	228	ND	ND	69.0	20,300	299	ND	ND	13,000	53,500	190,000	1,700	ND	79.0
138	20.0	72.0	224	ND	ND	75.0	24,600	10.0	ND	ND	14,000	53,500	180,000	2,000	ND	ND
138-DUP	19.0	71.0	217	ND	ND	72.0	24,100	9.00	ND	ND	14,000	55,600	180,000	2,000	ND	ND
139	18.0	58.0	204	ND	ND	76.0	29,800	ND	ND	ND	17,000	57,800	170,000	2,100	ND	ND
MCL	10.0	2,000	NE	100	NE	NE	NE	NE	NE	100	NE	NE	NE	NE	NE	NE
PRG	0.45	2,600	7,300	NE	11,000	730	NE	880	180	NE	NE	NE	NE	2,200	260	11,000

## Notes:

Shaded results exceed a health-based benchmark.

The preliminary remediation goal for arsenic assumes a cancer endpoint.

ID - Identification  
MCL - Maximum contaminant level  
NE - Not established  
ND - Not detected  
PRG - Preliminary remediation goal

### **3.2 Soil Samples**

Lead was detected in all 36 soil samples, at concentrations ranging from 5.60 to 1,720 milligrams per kilogram (mg/kg). Only one of those samples exceeded the EPA Region 9 PRG of 1,000 mg/kg for industrial soils. Zinc was also detected in all of the soil samples, at concentrations ranging from 23.2 to 103,000 mg/kg. Only one of those samples exceeded the EPA Region 9 PRG for industrial soils of 100,000 mg/kg. Table 7 summarizes the analytical data for the soil samples collected during this activity.

TABLE 7

**ANALYTICAL DATA SUMMARY  
FOR METALS IN SOIL SAMPLES  
AGROMAC-LOCKWOOD, OPERABLE UNIT 2 – GERING, NEBRASKA**

Sample ID	Lead	Zinc
	<i>Sample results and EPA Region 9 PRGs are listed in milligrams per kilogram</i>	
S1 (0-2')	41.9	7,720
S1 (2-4')	10.0	40.4
S2 (0-2')	19.2	1,190
S2 (2-4')	10.2	133
S3 (0-2')	26.4	5,410
S3 (2-4')	9.30	55.8
S4 (0-2')	13.5	2,040
S4 (2-4')	7.60	33.8
S5 (0-2')	148	7,140
S5 (2-4')	6.90	127
S6 (0-2')	145	6,290
S6 (2-4')	7.60	106
S7 (0-2')	1,720	103,000
S7 (2-4')	21.1	2,040
S8 (0-2')	198	29,100
S8 (2-4')	48.0	4,190
S9 (0-2')	7.70	3,640
S9 (2-4')	7.10	262
S10 (0-2')	7.80	60.5
S10 (2-4')	32.5	1,550
S11 (0-2')	11.2	12,700
S11 (2-4')	8.20	12,300
S12 (0-2')	66.0	6,360
S12 (2-4')	7.60	61.8
S13 (0-2')	33.9	673
S13 (0-2') DUP	17.3	432
S13 (2-4')	7.60	55.1
S13 (2-4') DUP	8.90	80.5
S14 (0-2')	25.8	784
S14 (0-2') DUP	75.6	1,510
S14 (2-4')	9.20	37.3
S14 (2-4') DUP	8.80	73.0
S15 (0-2')	14.5	647
S15 (2-4')	7.60	44.3
S16 (0-2')	18.5	1,400
S16 (2-4')	5.60	23.2
PRG	1,000	100,000

Notes:

Shaded results exceed a preliminary remediation goal.

ID - Identification  
EPA - Environmental Protection Agency  
PRG - Preliminary remediation goal

#### 4.0 SUMMARY

In April 2004, Tetra Tech START conducted sampling at the Agromac-Lockwood site in Gering, Nebraska, to delineate arsenic contamination in groundwater, and lead and zinc contamination in soils, which were identified in January 2002. For this activity, START collected groundwater samples from 1 municipal well, 11 private wells, and 22 monitoring wells. In addition, 36 soil samples were collected from the site. Total and dissolved arsenic were detected above the EPA Region 9 PRG for tap water in the municipal well sample, at concentrations of 6.00 µg/L and 7.00 µg/L, respectively. Total and dissolved arsenic exceeded the EPA Region 9 PRG for tap water and MCL in all of the samples collected from the private wells, at concentrations ranging up to 28.0 µg/L and 32.0 µg/L, respectively. In the monitoring wells, total and dissolved arsenic were detected at up to 113 µg/L and 112 µg/L, respectively. Only one soil sample contained lead and zinc at concentrations exceeding their respective EPA Region 9 PRGs for industrial soil. That sample contained lead at 1,720 mg/kg and zinc at 103,000 mg/kg.